

WE CLAIM:

1. A cooling fluid pump in which a cooling fluid is caused to flow to cool a heating element, comprising:

5 a casing brought into a direct contact or an indirect contact via a heat transfer member with the heating element;

a pump chamber provided in the casing;

an impeller rotatably provided in the pump chamber and including a pump groove formed in either one of both axial end
10 faces, the impeller having an axis of rotation located radially away from a center of the casing;

an inlet formed in the casing so that the cooling fluid is supplied therethrough into the pump chamber by an action of the pump groove with rotation of the impeller; and

15 an outlet formed in the casing so that the cooling fluid is discharged therethrough out of the pump chamber by an action of the pump groove with rotation of the impeller.

2. A cooling fluid pump according to claim 1, wherein the
20 casing has a part of an outer face opposed to the pump groove and brought into contact with the heating element.

3. A cooling fluid pump according to claim 1, wherein the pump groove passes near the center of the casing during rotation
25 of the impeller.

4. A cooling fluid pump according to claim 1, wherein the pump groove includes a first pump groove formed in either one

of both axial end faces of the impeller and a second pump groove formed in the other axial end face of the impeller, and the first and second pump grooves have axial dimensions differing from each other.

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5. A cooling fluid pump according to claim 1, wherein the pump groove extends axially from near a center of rotation of the impeller toward an outer periphery of the impeller and has an open outer peripheral end.

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6. A cooling fluid pump according to claim 1, wherein the impeller has an axial end face formed with a circular or annular convexity located nearer to the center of rotation thereof than the pump groove, and the convexity has an outer periphery formed with at least one cavity.

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7. A cooling fluid pump according to claim 1, wherein the impeller has a through hole passing the pump groove and extending axially through the impeller.

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8. A cooling fluid pump according to claim 4, wherein the impeller has a through hole passing the first and second pump grooves and extending axially through the impeller.

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9. A cooling fluid pump according to claim 1, wherein the impeller has an axial end face formed with an annular convexity located nearer to the center of rotation thereof than the pump groove, and the axial end face of the impeller further has a

concavity located nearer to the center of rotation thereof than the convexity, the concavity having a circular section, the pump further comprising an annular permanent magnet fixed to an inner circumferential face of the concavity and magnetized so that a multiple of poles are aligned circumferentially, a stator accommodating area formed in the casing so as to be opposed to the concavity so that the substantially overall stator accommodating area is located in the concavity, and a stator disposed in the stator accommodating area and having an outer circumferential face opposed to an inner circumferential face of the permanent magnet, the stator and the permanent magnet constituting an electric motor.

10. A cooling fluid pump in which a cooling fluid is caused to flow to cool a heating element, comprising:

a casing brought into a direct contact or an indirect contact via a heat transfer member with the heating element;

a pump chamber provided in the casing and having a center located axially away from a center of the casing;

an impeller rotatably provided in the pump chamber and including a pump groove formed in either one of both axial end faces, the impeller having an axis of rotation located radially away from a center of the casing;

an inlet formed in the casing so that the cooling fluid is supplied therethrough into the pump chamber by action of the pump groove with rotation of the impeller; and

an outlet formed in the casing so that the cooling fluid is discharged therethrough out of the pump chamber by action of

the pump groove with rotation of the impeller.

11. An electric apparatus including a heating element, comprising:

5 a cooling fluid pump in which a cooling fluid is caused to flow to cool a heating element, the cooling fluid pump including:

a casing brought into a direct contact or an indirect contact via a heat transfer member with the heating element;

a pump chamber provided in the casing;

10 an impeller rotatably provided in the pump chamber and including a pump groove formed in either one of both axial end faces, the impeller having an axis of rotation located radially away from a center of the casing;

an inlet formed in the casing so that the cooling fluid is supplied therethrough into the pump chamber by action of the pump groove with rotation of the impeller; and

an outlet formed in the casing so that the cooling fluid is discharged therethrough out of the pump chamber by action of the pump groove with rotation of the impeller.

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12. A personal computer comprising:

a CPU;

a cooling fluid pump in which a cooling fluid is caused to flow to cool the CPU, the cooling fluid pump including:

25 a casing brought into a direct contact or an indirect contact via a heat transfer member with the CPU;

a pump chamber provided in the casing;

an impeller rotatably provided in the pump chamber

and including a pump groove formed in either one of both axial end faces, the impeller having an axis of rotation located radially away from a center of the casing;

5 an inlet formed in the casing so that the cooling fluid is supplied therethrough into the pump chamber by action of the pump groove with rotation of the impeller; and

 an outlet formed in the casing so that the cooling fluid is discharged therethrough out of the pump chamber by action of the pump groove with rotation of the impeller; and

10 a heat radiating plate having a fluid passage with both ends connected to the inlet and the outlet respectively.